

Mine Development Assessment Process

MOUNT POLLEY COPPER/GOLD PROJECT

A report summarizing the reasons for the decision relating to the issuance of a mine development certificate, and outlining commitments, and permits, licence and approval information requirements



TABLE OF CONTENTS

		<u>Page</u>
1.0	Purpose of Report	3
2.0	Project Description and Review.	3
3.0	Reasons for Decision	5
3.1	Public Consultation	6
3.2	Aboriginal Consultation	7
3.3	Resolution of Key Issues	8
4.0	Commitments and Information Requirements for Permits, Licences and Approvals	22
4.1	Pre-development	22
4.2	Mine Construction	26
4.3	Permit Conditions and Operational Requirements	28

FIGURES

Figure 1:	Map identifying the location of the Mount Polley Project	4
-----------	---	---

1.0 Purpose of Report

An application for a Mine Development Certificate to enable the development of this mine has been reviewed under the Province's Mine Development Assessment Process. The purpose of this report is to outline the reasons for the decision relating to the issuance of a Mine Development Certificate under the *Mine Development Assessment Act*. It also identifies the environmental commitments made by, or agreed to by Imperial Metals Corp. with respect to project design and operation, and outlines information related to various permits, licences and approvals that will be required as project development proceeds.

2.0 PROJECT DESCRIPTION AND REVIEW

2.1 Summary of Project Proposal

The Mount Polley project, located 56 km northeast of Williams Lake (Figure 1), is owned by the Imperial Metals Corporation Group (formerly owned by a joint venture between the Imperial Metals Corporation Group and Corona Corporation). The Mount Polley deposit contains 51,402,000 tonnes of ore grading 0.38 percent copper and 0.55 g/tonne gold. Production of the proposed mine is targeted at an average rate of 13,700 tonnes per day or 5,000,000 tonnes per year over the life of the mine. The ore processing plant located onsite will produce a copper/gold concentrate by standard froth flotation at an average rate of 160 tonnes per day. The ore will be mined year-round by open pit mining methods using electric shovel and mechanical drive haulage trucks. The tailings pond will operate with a negative water balance and no effluent will be discharged into the environment.

Tailings will be deposited by gravity flow behind an impervious till dam constructed initially by the centreline method, and later by an upstream configuration. Surface runoff from waste dumps, mill site, as well as pit water, will be collected in sediment ponds, and recycled. Surface runoff not meeting water quality guidelines will be sent to the tailings pond, or treated before release to the environment.

Power will be obtained by a 3-phase 69 KV transmission line that will tap the Gibraltar Mine line at McLeese Lake, approximately 25 km north of Williams Lake. Freshwater for the mine and mill will be pumped from approximately 1.0 m of water storage to be created by raising the level of Polley Lake. Access to the project from the Likely Highway will be via the existing 14 km forestry road that will be upgraded to meet the transport requirements of the project.

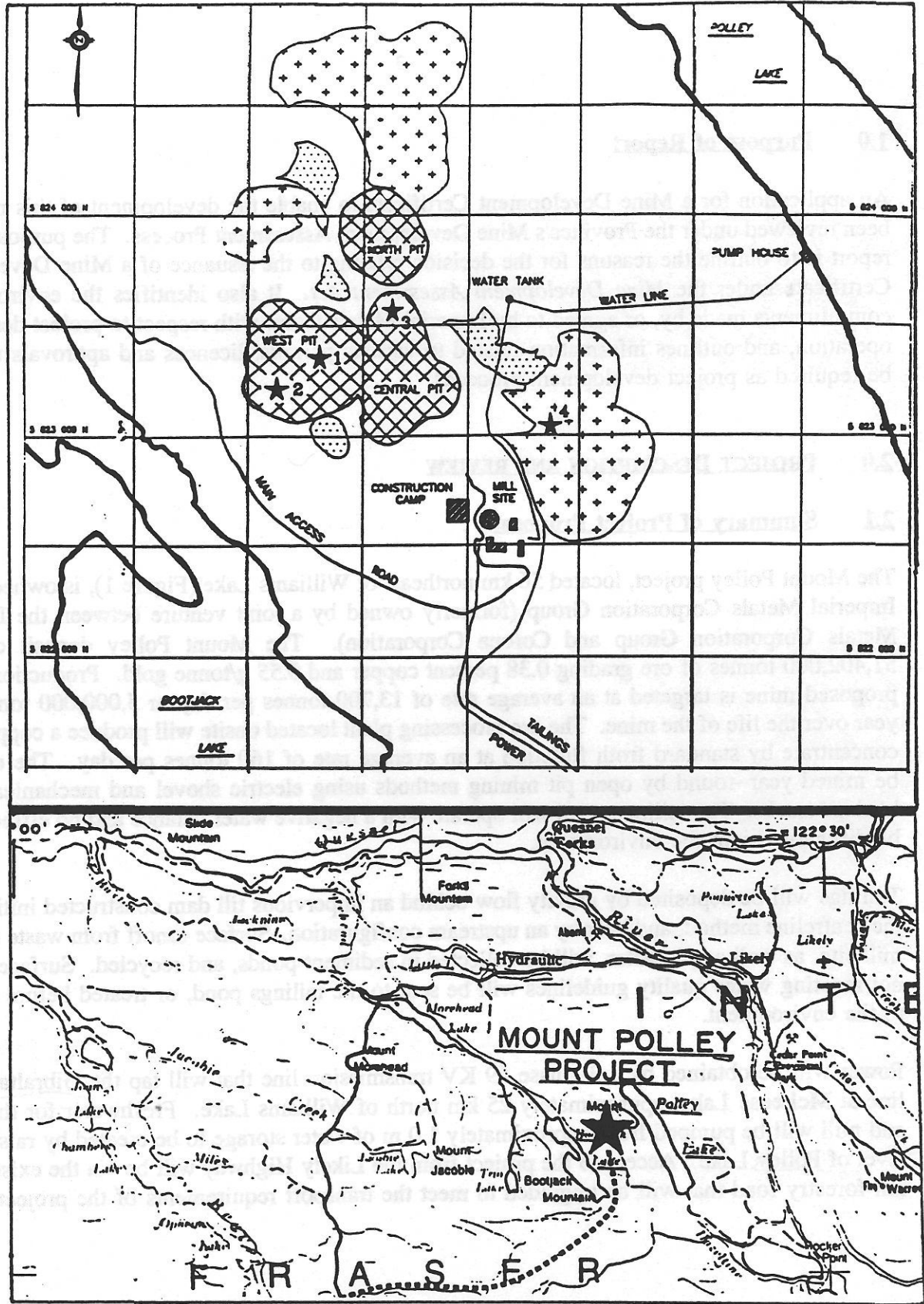


Figure 1. Map identifying the location of the Mount Polley project (Imperial Metals Corp., 1990, Mount Polley Project, Stage I Environmental and Socio-economic Impact Assessment, Vol. I.)

Project capital cost of \$131,400,000 and an average operating cost of approximately \$32,595,000 per year are projected over the life of the mine based on Imperial Metal's 1990 feasibility study conducted by Flour Daniel Wright consultants. The construction workforce will peak at 200 persons. The Mount Polley project employment estimates for the operational phase include 162 positions in Year 1, increasing to 229 positions by Year 7. The average earnings, including benefits, will be approximately \$50,000 per person per year for a total annual wages and salaries of \$8,100,000. The current under utilization of existing social infrastructure in the region indicates that the project will not require significant enlargement of public facilities.

Much of the project area has been subject to recent logging operations. However, the proposed development will result in a temporary loss of the regenerating vegetation cover and will consequently have a temporary impact on wildlife, hunting, trapping and cattle grazing. A three-stage reclamation plan, to be initiated in the first year of operation, has been developed with the objective of returning all mine-affected lands to their original use and capability.

3.0 Reasons for Decision

Pursuant to section 2 of the *Mine Development Assessment Act*, Imperial Metals Corp.'s application for a Mine Development Certificate has been reviewed by government agencies, local governments, aboriginal groups and the public. The federal government has screened the project in accordance with the *Environmental Assessment and Review Process Guidelines Order* (EARP). Based on this screening, it determined that the potentially adverse effects that may be caused by the proposal are insignificant or mitigable with known technology, in which case the proposal may proceed or proceed with the mitigation as the case may be.

The Minister of Energy, Mines and Petroleum Resources, with the concurrence of the Minister of Environment, Lands and Parks, has determined, based on a full technical review and public consultation program, that the potential adverse environmental impacts that may be caused by the project can be managed through existing legislation and programs. A Mine Development Certificate has been issued subject to commitments and requirements identified in this report and accompanying appendices.

Imperial Metals Corporation's application for a Mine Development Certificate consisted of the following:

- Letter from R. Pesalj (Project Manager) to N. Ringstad (Chair, Mine Development Steering Committee), 1990-01-05, outlining a strategy for the impoundment of Bootjack Lake, including preliminary downstream water and fisheries impact management proposals;
- Letter from R. Pesalj to N. Ringstad, 1990-01-25, outlining a strategy for Polley Lake as an alternative water supply to Bootjack Lake;

- Stage I Environmental and Socioeconomic Impact Assessment Report, Volumes I and II (July 1990), Imperial Metals Corporation;
- Stage I Environmental and Socioeconomic Impact Assessment Report, Supplementary Submission (October 1990), Imperial Metals Corporation;
- Stage I Environmental and Socioeconomic Impact Assessment Report, Responses to Comments by Agencies (January 1991), Imperial Metals Corporation;
- Mount Polley Project, An Evaluation of Runoff Estimates for the Mount Polley Project and Allocation of Fisheries and Mine Process Water Requirements (July 1991), Hallam Knight Piesold Ltd.;
- Letter and attachment from R. Pesalj to D.B. Letvak (Water Management Branch, Ministry of Environment), 1991-01-10, outlining the hydrological report from PWS Engineering;
- Letter from R. Pesalj to N. Ringstad, 1991-02-19, outlining the cost comparison between Polley Lake and Quesnel Lake water supply alternatives;
- Letter from R. Pesalj to D.B. Letvak, 1991-03-04, outlining Imperial Metals position on the average annual lake flow rates provided by PWS Engineering;
- Letter from R. Pesalj to D.B. Letvak, 1991-04-02, detailing Imperial Metals proposal to conduct further hydrological monitoring program;
- Letter from R. Pesalj to N. Ringstad, 1991-04-08, responding to final issues raised at February 14 and March 26, 1991 meetings;
- Letter and attachment from R. Pesalj to N. Ringstad, 1991-04-24, detailing the revised layout of the concentrate rail loading and storage facility and revised text of Section 8;
- Letter from Z. Nikic to N. Ringstad, 1992-04-16, outlining agreements reached at the April 10, 1992 meeting.-.

3.1 Public Consultation

Imperial Metals Corporation held a series of public meetings regarding the Mount Polley project at the prospectus stage of the review process. The meetings were advertised in local newspapers, posted throughout the communities and announced through the local radio stations. Meetings were held on November 22, 1989 at Williams Lake and Likely, June 19 and 20, 1990, at Williams Lake (two meetings) and Likely, and June 21 at 150 Mile House. The purposes of the meetings were to introduce the company to the public, and to allow the public an opportunity to

review and comment on the project. The various concerns raised included impacts to cattle grazing along the access road, commuting time for employees, impacts on Polley and Bootjack Lakes, construction scheduling, employment opportunities, and the nature of chemicals to be used in the flotation process.

Additional meetings were held by Imperial Metals as part of the Stage I consultation process in Williams Lake and Likely on August 27, 1990. The meetings provided the company with further opportunities to present and discuss the most recent mine plan with the public and gather additional feedback.

Several of the issues raised during both this consultation process and the initial review by government required lengthy iterations and further planning and assessment by both government and the company. The results of this further assessment were made available to the public and aboriginal groups for review. An interim report entitled Mount Polley Copper/Gold Project – A Report Summarizing the Results of the Technical Review and Outlining Commitments, Permit License and Approval Requirements was distributed directly to identified stakeholders and aboriginal groups, and made available for review by the public at five locations in the Williams Lake, Quesnel and Likely areas in June 1992. A Mine Development Assessment Process Information letter outlining background on the project, the province's Mine Development Assessment Process, summary of the review to date, and an outline of further public consultation to be undertaken prior to a decision by government on project approval was widely distributed in late June, 1992.

A field tour for identified stakeholders was held on July 8, 1992, and government sponsored meetings with stakeholder groups were held July 8 and 9 in Williams Lake and Likely, respectively. Full public meetings sponsored by government and conducted by Mr. Peter McPherson, an independent facilitator, were held July 22 and 23 in Likely and Williams Lake respectively. An accurate record of the stakeholder meetings and a report of the public meetings were provided to the stakeholders, aboriginal groups and the general public in late July and early August.

3.2 Aboriginal Consultation

A copy of the prospectus for Mt. Polley was sent to the Cariboo Tribal Council for review and comment. Imperial Metals first contacted the Cariboo Tribal Council in a letter on October 13, 1989, expressing Imperial's commitment to protecting the environment and its willingness to address social issues with respect to the project. Imperial also gave its assurance that the operations would meet or exceed all existing government regulations. Imperial invited the Council to provide comments on the project and on the Stage I report which was submitted to the Council the following year.

On February 1, 1991, Imperial Metals met in Williams Lake with the Council and representatives of the Williams Lake and Soda Creek Bands. The Council and Band members were informed

of the project's status, environmental management and financial plans for project development. Local aboriginal involvement and on-the-job training were discussed, as was the company's proposed employment policy.

The Bands were also informed that the Mount Polley project would not have any mill effluent discharge and that all tailings pond supernatant would be recycled. The company agreed to provide additional information to the Council regarding the water supply analysis for Polley Lake and reagent toxicity associated with the tailings. It was also agreed that a committee to identify aboriginal employment opportunities during the construction and operation of the project would be formed prior to the project proceeding. Other items discussed were project investment opportunities for the Cariboo Tribal Council, and linkage opportunities for the proposed trailer park development north of 150 Mile House.

The Cariboo Tribal Council was provided with a copy of the June 1992 summary of the technical review, and were invited to participate in the stakeholder field tour and meetings, and the public meetings sponsored by government. Although the Council did not participate in further consultation, it was provided with the results of the further consultation program.

3.3 RESOLUTION OF KEY ISSUES

Pursuant to section 2 of the *Mine Development Assessment Act*, Imperial Metals Corp.'s application for a Mine Development Certificate has been reviewed by government agencies, local governments, aboriginal groups and the public.

The review has focussed on the following key issues: Socioeconomic impacts, Aboriginal concerns, water supply, management of fisheries and aquatic resources, wildlife management, mitigation of acid mine drainage, management of groundwater, tailings pond management, and the design and location of the load out facility. An acceptable load out facility has yet to be located and approved. As such, the Mine Development Certificate does not include approval for any load out facility proposed throughout this planning process. However, prior to the construction of a loadout facility, the company must submit detailed plans for review and approval by the appropriate regulatory agencies.

Proposal for Further Public Consultation

To facilitate ongoing opportunities for public consultation if and when the project proceeds, a government-sponsored public liaison committee will be established. The purpose of this committee will be to:

- o provide for ongoing liaison between Imperial Metals, provincial and federal agencies, Aboriginal people, local governments and the general public; and

- o use local knowledge to review and discuss the monitoring information collected, and to advise Imperial Metals and regulatory agencies of additional information or measures that may be required to ensure adequate protection of the area's environmental and recreational resources.

Representatives of local governments, environmental and resource use groups, and the Cariboo Tribal Council, will be invited to participate, in addition to Imperial Metals Corporation and provincial and federal regulatory agencies.

The public liaison committee will be set up expeditiously once the company decides to proceed with detailed permitting. Terms of reference for the committee will be developed by the committee and approved by the Mine Development Management Committee.

The Committee will review and advise on issues of public interest and concern, such as: ongoing Polley Lake water supply monitoring; fishway operation and effectiveness; effects of the mine on angling use; groundwater quality, quantity and flow (e.g. hydrogeological relationships between Bootjack Lake and the West Pit); spill prevention and emergency response planning; and wildlife impacts and mitigation, and impacts on trapping and recreational use.

To facilitate the work of the committee, Imperial Metals will be required to prepare an annual environmental report. Annual reporting will address pertinent matters such as: monitoring results for the past year; the effectiveness of impact mitigation measures; regulatory compliance issues; and future project planning and monitoring.

The public liaison committee will be expected to liaise with the general public using a communication strategy developed by the committee and agreed to by the Mine Development Management Committee.

Management of Socioeconomic Impacts

The Province encourages Imperial Metals Corporation to develop a comprehensive and detailed human resource plan, including hiring and training requirements for mine and mill personnel, to enable local communities to gain access to employment and training opportunities.

Addressing Aboriginal Concerns

In a February 1, 1991 meeting with the Cariboo Tribal Council, Imperial Metals agreed to work with the Council to provide employment opportunities for Aboriginal peoples during construction and operation of the project.

In a letter of March 14, 1991, the Cariboo Tribal Council provided general support for the project. However, the Council raised two outstanding areas of concern:

- o the potential for a water deficit in Polley Lake and the adequacy of inflow for both mining activities and the fisheries resource; and
- o the environmental impacts of mill reagents.

In March, 1991, the company provided the Council with a report which provided data indicating that mill reagents would not be harmful to fish and life in and around the streams in the vicinity of the mine. A report prepared for Imperial Metals indicating that there would be sufficient inflow to Polley Lake to satisfy both the mine and the fisheries resource was also provided. The Management Committee also provided the Council with a copy of the interim report entitled *A Report summarizing the Results of the Technical Review and Outlining Commitments, and Permit, License and Approval Requirements*, June 1992. This report summarized the results of the government's lengthy review and assessment of the water supply question.

The Province, in its review of the company's prospectus, requested an overview assessment of the heritage resources of the Mount Polley project area. This assessment was conducted by Points West Heritage Consulting Ltd. and the results were presented in the company's Stage I submission. The purpose of the study was to determine the heritage resource potential or sensitivity of the proposed development area. The major post-contact historic events of this region related to mining. Research indicated that prehistoric sites of the Fraser River division of the Shuswap Band could also be encountered. Field investigations however, indicated that large portions of the study area have been impacted by recent logging activities. Consequently, the majority of the development area is typified by low heritage resource potential.

Bootjack Lake was considered by the consultant as the only site which is both relatively undisturbed and of moderate heritage resource potential. Imperial Metals Corporation agreed that if the Bootjack Lake watershed became the location of the tailings pond, as proposed, or if the tailings pond was located in an area of moderate or greater potential, additional heritage resource potential investigation would be conducted before construction activities take place. If neither of the above becomes the case, then no further investigations would be necessary.

Water Supply

The location of the water supply for the mine was the key technical issue raised during the review of this project. In its prospectus, Imperial Metals proposed the use of Bootjack Lake as the water supply for the mine project. Bootjack Lake and adjacent Polley Lake, support a significant sport fishery. As a result of the need to protect the local fishery, the company subsequently proposed Polley Lake in its Stage I submission because of its greater watershed and runoff capability.

As part of the Stage I review, the Province requested that the company consider Quesnel Lake as the water supply for the mine. The benefits of the Quesnel Lake option were deemed to include the following:

- o Quesnel Lake would be a more reliable water supply because of its size and catchment area.
- o The requirements for most of the ongoing assessment and monitoring of fisheries resources in and downstream of Polley Lake would be reduced.
- o Although the initial capital costs would be higher, the long-term operational, monitoring and abandonment costs might be lower than for Polley Lake, since there would be no requirement for a dam, fishway or any of the mitigation measures required for Polley Lake or Hazeltine Creek.

Imperial contracted Wright Engineers Ltd to conduct a preliminary assessment of the Quesnel Lake option. The cost comparison revealed that over the life of the mine, Quesnel Lake water supply capital and operating costs, including environmental and all other monitoring costs, would be \$4.2 million greater than the costs of the Polley Lake water supply. The Province accepted the cost comparison and supported Imperial's request to continue further planning and assessment of the Polley Lake option on the understanding that an adequate water supply to satisfy both the mine and fishery requirements would have to be demonstrated prior to project approval.

Following the company's decision to continue to seek approval for Polley Lake, Ministry of Environment, Lands and Parks staff carried out an extensive analysis to determine whether sufficient water would be available to maintain the fishery, and meet the operational requirements of the mine. The Ministry anticipates that the lake level fluctuations will not increase significantly over naturally occurring levels. Consequently, there would likely be little change in lake productivity or pH anticipated as a result of impounding Polley Lake as a water supply.

The hydrology analysis was conducted independently from an earlier water supply analysis carried out by consultants for Imperial Metals. Using two analytical methods, the Ministry estimated the annual runoff for the Polley Lake watershed based on data collected on Hazeltine Creek for the 1991 freshet period, and a comparison with data from comparable hydrometric stations with a longer record of measurement. The estimated runoff was then compared to fisheries flow requirements determined by the Ministry of Environment, Lands and Parks, and mine water needs, under a variety of drought flow sequences to determine whether the estimated supply would be adequate under a range of low flow conditions. The following results were shown:

- o Based on a comparison with other hydrometric stations in the area, mean annual runoff was estimated to be 6 litres per second per square kilometre (L/s/km²). This was also the runoff amount estimated by the company in its analysis.
- o Based on the 1991 monitoring data for Hazeltine Creek and hydrological analysis, which incorporated a longer period of measurements from other stations in the region, the mean annual runoff was estimated to be 7.5 L/s/km².

The lower, more conservative estimate was adopted for further analysis. The analysis demonstrated that with the reservoir at average carryover going into a drought, the storage could meet mine and fishery requirements for the following drought conditions:

- o a single year drought of 28 percent of mean annual runoff;
- o two consecutive drought years, each 60 percent of mean annual runoff; and
- o three consecutive drought years, each 71 percent of mean annual runoff.

The analysis demonstrates that there is a negligible chance of a single-year drought depleting the reservoir to the point where problems would develop. If a water shortage were to develop, it would likely occur during a sequence of at least two consecutive drought years that exceeded the design conditions.

In the event that a water supply shortage occurs over the life of the project, Imperial has committed either to find an alternative source of water acceptable to the Province or to suspend or reduce production at the mine during the shortage to maintain fishery flows. The Ministry of Environment, Lands and Parks will estimate the duration and extent of the emergency on the basis of prediction of runoff, lake level, and additional hydrometric information available at that time. The Ministry will consult with Imperial Metals on the preferred course of action. Since the greatest likelihood of a water shortage would occur during a multiple-year drought, the company will likely have advance warning of the potential for a water shortage and could schedule a shutdown, or develop an alternative source of supply early enough to reduce the financial impact to the mine.

The Ministry of Environment, Lands and Parks will have priority for fish flow requirements over mine requirements in the licensing of flows out of Polley Lake. The Ministry will apply for a water reserve for conservation purposes under Section 44 of the *Water Act*, for all of the water in the Hazeltine Creek watershed, including the Polley Lake and Bootjack Creek watersheds. The company's current water license application for Polley Lake will not be processed until the water reserve is in place. The Ministry can decide to proceed with a priority license or continue with the reserve, whichever is deemed to give the best protection of fisheries flows at the time water is allocated for mine use.

During a multi-year drought, it may be possible to modify water management operations to conserve storage and still allow the mine to operate while protecting fish. In addition, there are a number of ongoing measures to which Imperial Metals has committed that will use the water efficiently:

- o construction of a properly designed fishway around the dam on Polley Lake;
- o removal of beaver dams and control of beaver dams under Ministry of Environment, Lands and Parks direction in Hazeltine Creek to improve access to spawning areas;

- o monitoring of fish flows in Hazeltine Creek in conjunction with the monitoring of the use of the fishway at the outlet of Polley Lake, to refine fish flow requirements.
- o construction of the dam at the outlet of Polley Lake in a manner that will allow some of the "dead storage" to be released into Hazeltine Creek when required to meet fish flow needs. The amount of dead storage available will be determined in consultation with the appropriate Ministry to avoid undue drawdown of Polley Lake and resulting impacts to lake biota and recreational opportunities.

Drought conditions during the period of reservoir filling could delay or even cause storage to be emptied. It is estimated that it would take four years of average runoff to fill the reservoir created from Polley Lake, and at the same time meet the needs of the fishery and the mine at full production. However, according to Imperial Metal's development schedule, the outlet dam will be constructed by October of the first year of project development. Full production would not begin until April or May of the third year. During the time between dam construction and processing of ore, only fishery flows will be released as the mine process requirements will be minimal, thus it is expected that the reservoir could be filled in 2-3 years of average runoff.

With low reservoir levels, the amount of lead time available to Imperial Metals to prepare for the possibility of an extreme water shortage requiring emergency measures is reduced. To conserve water during the startup period and throughout the life of the mine, Imperial Metals has committed to implement maximum collection and reuse of runoff from the waste dumps and mill site, in addition to recycling from the pits and tailings. In addition, Imperial Metals will benefit from continuing hydrometric monitoring on Hazeltine Creek and Polley Lake to improve the runoff estimates for the watershed. This will assist the company in planning for contingencies needed to deal with a possible water shortage.

Although the possibility of global climate change and its effects on precipitation and temperature was of concern in the above water supply analysis, the Province cannot determine the effects of climate change on this project with any accuracy because of the lack of scientific understanding of the magnitude, direction and location of possible changes in climate. Because of the uncertainty regarding climate change, the Province has taken the conservative approach of adopting the lower estimate of runoff for the Polley Lake watershed. The conservative approach in analyzing the water supply, and Imperial Metal's commitment to implement the measures described above to reduce mine water supply requirements in a drought situation, provide sufficient assurances to deal with the uncertainty of climate change for the projected twenty-year life of the project.

Management of Fisheries and Aquatic Resources

Bootjack and Polley Lakes are popular locations for anglers. The presence of an active mine in close proximity to Bootjack and Polley Lakes may diminish the quality of the fishing experience. To offset possible impacts on recreational use, the company will undertake measures to minimize the aesthetic impacts of the project (e.g. dust suppression, control of noise from blasting,

progressive reclamation). Measures to enhance the fishing and recreational experience, such as improvements to recreation sites on the lakes, will be developed in consultation with the proposed Mt Polley public liaison committee and the Ministry of Environment, Lands and Parks.

The fish flow requirements for Hazeltine Creek used in the water supply analysis were based on an assessment of desirable flows for all life stages of rainbow trout, using results of on-site studies conducted by consultants for the Ministry of Environment, Lands and Parks and Imperial Metals. Flow requirements include migration, spawning, egg incubation and rearing of trout, and the provision of "flushing" flows every second year of up to 500 percent of the mean annual discharge, to maintain channel integrity and spawning and rearing capability. In addition, a fishway, designed by the company will be constructed and operated by Imperial Metals to ensure adequate passage through the water storage dam for all sizes of fish. Although the fishway design presented in the company's Stage I submission is acceptable to the Ministry of Environment, Lands and Parks, improvements in fishway design have been made since that time. The company will update the original design in consultation with the Ministry of Environment, Lands and Parks prior to making the application for the necessary *Water Act* approval for the dam.

Regulation of flows from Polley Lake may provide benefits to fish production, particularly during the rearing period in late summer and early fall, when present unregulated flows are naturally reduced to near-zero. In order to provide the opportunity for the Ministry of Environment, Lands and Parks to manage flows at the completion of mining, Imperial Metals has committed to transfer the water licence for the dam and storage to the Ministry of Environment, Lands and Parks, upon mine closure, or remove it if requested by the Ministry of Environment, Lands and Parks.

The tailings disposal site is to be located within the upper catchment of the Edney Creek tributary, approximately five kilometres southeast of the mill site. The tailings will inundate a small wetlands area in the upper watershed of Edney tributary and could possibly impact flows and water quality in the tributary. Rainbow trout occur in Edney tributary. The company will further sample Edney Creek tributaries and water courses that could potentially be impacted by the tailings pond, to determine the extent of fish values and the potential impact of the tailings pond on fish and waterfowl values in the area. Compensation for fish and waterfowl habitat lost will be required if further studies confirm the presence of resource values.

Finally, the company will undertake a monitoring program to assess the continued viability of the fishery in the project area during the operation of the mine. This program is intended to monitor the impacts of the mine on Bootjack and Polley Lakes and to provide data on the effectiveness of the fishway and the regulated flows in Hazeltine Creek. The assessment and monitoring programs must collect at least one, and preferably two years, of background monitoring before significant disturbance from the mine. Monitoring will continue during the operational phase until such time as any effects of the construction and operation of the mine have been assessed.

Wildlife Management

The principal ungulates in the area are moose and mule deer. The area of the mine is used primarily as summer range by mule deer and to a lesser degree by moose. Excessive snow depths and availability of winter forage limit the habitat for ungulates in the area, although moose use the area in the early winter, on their way to traditional winter ranges. Moreover, summer range is not generally a limiting factor in the region.

Black bear, coyote and wolf also occur in the project area, along with a variety of other smaller mammals. There were no threatened or endangered species, or unique or critical habitat, found in the vicinity of the minesite. Imperial Metals has agreed to reclaim the area following development to its original use and capability. The project is not anticipated to impact critical ungulate winter range, and it is unlikely that these species will be affected by habitat loss.

The area around the Mt Polley site has been extensively logged. As a result, vehicle access is afforded to both Polley and Bootjack Lakes. Furthermore, these existing access roads connect with major north-south and east-west forestry roads providing a broad road network. For the mining project, the forestry road into the mine will be upgraded to handle Highway load trucks. The company will undertake measures to reduce the number of wildlife-vehicle collisions, such as speed restrictions, on the road from the Likely Highway into the minesite. Because of the extensive road network that already exists in the area, development of the Mt. Polley project is not expected to result in increased access.

Construction of the tailings pond will inundate a portion of the Gavin Lake road. Imperial Metals will be responsible for relocating a portion of this road to a location immediately below the toe of the tailings dam to avoid encroachment into wetlands located near the south end of the proposed tailings pond.

Both guide/outfitters that utilize the area have been contacted by the company and have indicated that the project area forms only a minor part in their annual hunting and guiding activity. As in other mining projects, there will be a no-shooting-area imposed around the mine for the safety of workers. This may disrupt the established hunting patterns to some degree.

There is one registered trapper in the project area. Imperial Metals should continue discussions with this trapper regarding management strategies to address any impacts on trapline species.

Mitigation of Acid Mine Drainage

Acid generating potential of the Mount Polley orebody and waste rock was evaluated by static and kinetic tests to design the waste management plan presented in the company's Stage I Submission. Static methods consisted of acid-base accounting tests to detail acid-producing and acid-consuming components of each sample, while kinetic testing consisted of humidity cells. Samples used were ore, low grade material and waste from drill cores, while tailings samples were taken from metallurgical bench scale tests.

The average pyrite content within the Mount Polley orebody is less than 1 percent and acid generation is not expected to be a concern. Test results have shown that if localized AMD develops, the majority of rock samples contain adequate buffering materials to neutralize acid.

The following strategies for mitigating or neutralizing any potential AMD will be implemented by Imperial Metals:

- o collection and recycle of waste rock drainage and mill site drainage, and implementation of other waste conservation steps to prevent discharges from these sources, or collection and treatment of all site runoff and wastewater discharges to a level that will not cause the B.C. Water Quality Criteria to be exceeded;
- o confining all surface drainage inside the development area by a series of drainage ditches in and around the waste dumps, and other disturbed areas to direct runoff into the sediment pond or tailings pond for recycle; avoiding discharge of water from the mine area; and planned drainage collection to keep contamination away from surface waters if localized seeps of acid occur; and
- o direct recycling of all water from the pits or discharge to the tailings pond for later recycling.

Management of Groundwater

The mine plan for Mt Polley consists of the excavation of North, South and West pits on the property. The maximum depth of the West Pit at completion will be 36 m below the elevation of the Bootjack Lake surface. The distance separating the top of the pit wall from Bootjack Lake is approximately 450 metres. The distance between the pit and the lake increases with pit depth due to the cone shape of the pit. Polley Lake and 6K Creek, the nearest water bodies to the North and Central pits, are separated by a greater distance.

Permeability data and investigative work in the area of the pits has indicated that the rock structure provides a natural barrier to flow from Bootjack Lake into the pit. The reversal of flow from the pit to Bootjack Lake is not expected. However, as a safeguard, the following measures have been committed to by Imperial Metals:

- o Imperial Metals will implement a groundwater monitoring program acceptable to the Province at least one year prior to the start of pit development. This program will include the installation of a number of wells for monitoring groundwater quality between the pit perimeters, and minesite and 6K Creek, Bootjack and Polley Lakes, to monitor background water quality and direction/volume of flow. Groundwater monitoring wells may be required downstream of waste dumps if surface water quality monitoring indicates the possibility of associated groundwater contamination.

- o During the operation of the pits, Imperial Metals will continue to evaluate the pit geology and measure the rate of seepage into and out of the pits to determine the potential for inflow/outflow.
- o In addition to the above commitments, Imperial Metals, as a condition of permitting, could be required to continue to monitor groundwater following mine closure for a period to be specified by the Ministry of Environment, Lands and Parks (such requirements will be determined during the final stages of planning for mine closure and site abandonment).
- o Imperial Metals will provide a contingency plan outlining measures, such as grouting or drilling, to relieve hydrostatic pressure to deal with the potential for inflow into the West Pit from Bootjack Lake.

Tailings Pond Management

Imperial Metal's original proposed location for a tailings pond to the north of Mount Polley was later changed to the location proposed in the Stage I Submission in the Edney Creek watershed because of problems in acquiring tenure on the original site. Federal agencies and the Ministry of Environment, Lands and Parks identified concerns with this new location because of the trout and salmon resources that exist in Edney Creek and its tributaries. In order to protect this sensitive watershed, the company has agreed to significant water conservation measures within the mine and mill to reduce flows to the tailings pond. The company has agreed to recycle as much of the pit water and tailings as possible to the mill. In addition, the company has demonstrated that measures, such as the use of water for dust suppression combined with evaporative techniques, will allow it to maintain a negative balance in the tailings pond.

Most of the tailings basin is covered with low permeability till that will provide an impervious layer beneath the tailings. However, to control any seepage that does occur from the tailings pond, the company will install underdrains and pump collected seepage back into the tailings pond.

The use of test wells and monitoring of groundwater down gradient of the tailings pond will be required in addition to the under drain. Should monitoring indicate groundwater contamination, dewatering wells and water treatment facilities will be required to intercept and control seepage to ensure B.C. Water Quality Criteria for aquatic life, livestock, wildlife and irrigation are not exceeded.

To prevent damage to sensitive fish stocks in Bootjack Creek and Edney Creek tributary from a spill from the tailings line, the Waste Management Permit will include specific details and a contingency plan for spill control and monitoring measures (e.g. spill basin location, tailings line crossing of Bootjack Creek, alarm systems, etc.). One of the measures is the siting of a catchment basin up-grade from Bootjack Creek with sufficient capacity to hold the volume of tailings in the tailings pipeline.

Loadout Facility Location

The copper/gold concentrate will be transported in covered Highway load trucks to a site to be selected on the British Columbia Rail line. Environmental concerns related to a loadout facility include fugitive dust and possible runoff of contaminants from the site and during transportation to the site.

B.C. Rail is working with Imperial Metals to find an acceptable site. The site originally proposed by Imperial Metals at Enterprise was unacceptable to the Ministry of Environment, Lands and Parks, based on environmental grounds, and another proposed site investigated by the company at Lac La Hache has since been withdrawn due to public concerns.

Loadout facilities are in common use throughout the province. Government agencies are confident that Imperial Metals can design and build an acceptable facility for its Mount Polley project, using standard control technology.

The load out facility has not been included in the definition of the project and, as such does not require a Mine Development Certificate. However, prior to construction of a load out facility, the company must submit detailed plans for review and approval by the appropriate regulatory agencies. These plans need to demonstrate that the facility can be operated in a manner that is acceptable to the public and will prevent the escape to the receiving environment of copper concentrate or any hazardous materials used, or transported to and from the site.

Resolution of Issues Raised During the July 1992 Further Public Consultation Program

Identified stakeholders, the general public and aboriginal groups were provided with an opportunity to review the results of the overall assessment of the company's proposal, and comment further in a series of public meetings sponsored by the province. As a result, a number of issues were raised which have been grouped into the following categories:

- o have already been addressed to the satisfaction of the appropriate government agencies and summarized in the technical review documentation;
- o were considered significant and required clarification or further explanation and documentation prior to a decision on the project; or
- o were considered of a routine permitting nature and that could be handled by the proposed Public Liaison Committee during the review of the company's applications for statutory licenses, permits and approvals.

In addition, there were a number of issues raised relating to employment, project feasibility and other matters considered the responsibility of Imperial Metals to address. Such company responses are provided in the proceedings of the stakeholder and public meetings.

Outlined below is a summary of the responses to issues raised by the public that were felt important to address prior to a decision on project approval. These issues were extracted from the proceedings of the stakeholder and public meetings.

1. What will be the impact to vegetation and recreation due to water level fluctuations in Polley Lake?

- o The shoreline of Polley Lake is relatively steep. As such, the approximately one metre impoundment will have a minor affect on either shoreline vegetation or recreational use. Natural lake levels fluctuate by over 0.5m and the impoundment will have the effect of holding high water levels longer throughout the summer and fall. Any vegetation that requires removal will be handled carefully to minimize impacts on shoreline stability or aquatic values.

2. What are the actual boundaries for the minesite within the mineral claim boundary?

- o The boundary of the actual minesite and the area of surface disturbance are much less than the mineral claim boundary outlined in the company's submission. Figure 1 of the Reasons for Decision document outlines the mine pits waste dumps and road access associated with this project. Fold out maps in the company's original Stage I reports provide an overview of the locations of project infrastructure relative to Bootjack and Polley Lakes. The development of this project will not restrict access to, or use of, either Bootjack or Polley Lakes for recreational purposes. However, an area around and including the minesite will be closed to the discharge of firearms to protect the workers.

3. When the water supply analysis was conducted, was it taken into consideration that the mine will occupy a percentage of the watershed, and what impact would this have on its contribution to the Polley Lake water supply?

- o Yes. In evaluating the run-off, there were a variety of sources of uncertainty of which this was one. However, this was accounted for by taking an extremely conservative approach in using low estimates of precipitation and run-off in the hydrology assessment.

4. What measures will be taken to reduce dust during the mining operations?

- o The company will be responsible for dust suppression for any open air facilities, as is a normal practice for industrial sites. Water spraying will be employed to hold dust down. With respect to dust generation for the milling operation, the crushing of large rocks is by dry methods. However, grinding of the crushed ore is conducted in a wet environment and should not pose any dust problems. As onsite dust could be hazardous to the health and safety of the workforce, compliance with dust levels established in the Mines Act Code will be required not only by the regulatory agency, but also by the workers themselves. Dust in and around the minesite should not pose a significant problem so long as proper dust control programs are in place and maintained.

5. **What Assurance does the public have that the terms and conditions of the Mine Development Certificate, or the permits and approvals will be monitored and enforced?**
 - o The company will be required to apply for, and obtain, all applicable statutory licences, permits and approvals as project development proceeds. The proposed public liaison committee can provide input to the review of these applications and be involved in the review of monitoring and compliance data and information. Any non-compliance issues can be discussed by the committee and the appropriate regulatory authority requested to improve enforcement if necessary. Enforcement of the *Waste Management Act* permit and approval conditions has been improved, with substantial fines now possible for discharges that are out of compliance. In addition, resource companies are taking more responsibility for protecting the environment and building a positive corporate image.

6. **What is the tourist potential of the recreational fishery on Polley Lake**
 - o Regional creel surveys estimate that Bootjack and Polley Lakes currently receive a combined annual use of 6000 to 7000 angler days. Regional fisheries surveys indicate that approximately 70% of the total regional angling is conducted by out-of-region residents, primarily from the Lower Mainland and Pacific Northwest. Recent surveys also indicate a general downturn in average annual use in the region, possibly due to the sluggish western economy. The impact of the mine development on the recreational use of both Polley and Bootjack Lakes cannot be determined at this time. However, the company has agreed to monitor the fishery and discuss mitigation strategies to offset any reduction in use resulting from the presence of the mine.

7. **Is there a risk that Polley Lake will be pumped dry?**
 - o Drawdown of Polley Lake below the natural low water level would only be considered as a last contingency to be used during the initial filling of the impoundment in order to ensure adequate downstream fisheries flows. However, at no time would the lake ever be pumped dry as, the company has committed to reducing or suspending production in the event of a severe water shortage. As well, the Ministry of Environment, Lands and Parks will seek Cabinet approval to place a reserve on the Polley Lake water supply to ensure downstream fisheries flows are given priority in water allocation.

8. **What environmental standards will be available to judge that the environment is being protected?**
 - o Discharge criteria will be established in statutory licences, permits and approvals. The criteria used to set compliance levels are based on the need to protect the environment and worker health and safety. Compliance with permit requirements, combined with detailed monitoring and annual environmental reporting will assist the public liaison committee assess the state of environmental health. The committee can discuss measures

to increase enforcement of compliance, adopt upgraded environmental protection plans if needed and maintain a close liaison with regulatory agencies.

9. What are the risks to the environment from chemicals used in the milling process?

- o Small amounts of non-toxic reagents are added to the process to assist in the separation of the ore and the production of an ore concentrate. However, the Mount Polley milling process will not be using cyanide or other potentially toxic materials. The company provided a summary of the chemicals to be used, and their toxicity to the Cariboo Tribal Council in March 1991. Chemicals to be used were shown to be non-toxic and not harmful to aquatic life in and around the minesite.

10. What happens to the mine if it is sold? What regulations apply to the purchaser

- o If the property and its assets were to be sold, the purchaser would conduct a due diligence review to gain a detailed understanding of all assets and liabilities that would accompany the transfer. A new owner would have to accept all responsibilities, terms and conditions of existing permits, licenses and approvals, and post an adequate level bond. Reduction of responsibility or liability does not occur as a result of a property transfer.

11. What alternative sources of water have been identified if there is a series of droughts and an identified water shortage?

- o A drought situation that would create a significant water shortage would likely occur after several years of consecutive droughts. This emerging problem would be identified early and contingency plans developed. Options include reduced production, make-up water from onsite wells or from Quesnel Lake, improved recycling and other water conservation measures.

12. What impact will the impoundment of Polley Lake have on the safety of winter recreation on the lake?

- o The estimated drawdown of the lake between mid-December and April during an average run-off year will be approximately 5 centimetres, and 18 centimetres in a dry year. Such a fluctuation is not considered significantly different from natural fluctuations, and is not considered to pose any unnatural hazards to winter recreation.

13. Will the pH of the lake be affected by the impoundment of Polley Lake

- o As the impoundment levels are not significantly greater than the natural fluctuations, no impacts are expected.

14. How large an area will be excluded from the discharge of firearms?

- o The no-shooting area will be made as small as possible, so long as the health and safety of the mine workforce is protected. The actual size and boundaries will be negotiated between the Ministry of Environment, Lands and Parks, Ministry of Energy, Mines and Petroleum Resources and the company.

15. What will be the effect of the mine on moose and deer populations?

- o The mine is not anticipated to impact critical ungulate winter range, and it is unlikely that these species will be affected by habitat loss. The reclamation end land use objectives include restoring the land to its pre-disturbance level of productivity and use. However, there is a potential for increased vehicle collisions with ungulates resulting from the increased truck traffic on an upgraded road system. The company has agreed to minimize the potential for collisions by restricting speeds and other measure that may prove useful.

**4.0 COMMITMENTS AND INFORMATION REQUIREMENTS
FOR PERMITS, LICENCES AND APPROVALS**

Imperial Metal Corp.'s proposal, discussed in Section 3.0 above, was agreed to by agencies at the conclusion of the review of the application, and it was decided that any remaining issues could be resolved during permitting and licensing. If a Mine Development Certificate is issued to Imperial, the following requirements, agreed to by Imperial, would guide the finalization of permits, approvals, licences, orders or directions issued under various statutory authorities. Nothing in the summary of commitments and requirements inhibits the parties in continuing to negotiate and refine the conditions of permits. Other as-yet-unidentified regulatory requirements may also emerge during the permitting phase or after project development has begun.

**4.1 Pre-development (Construction of camp water supply,
road upgrading and site preparation)**

Prior to commencement of any project development or mine construction, Imperial Metals shall apply for and obtain a reclamation permit from the Chief Inspector of Mines in accordance with Section 10(1) of the *Mines Act*. The application shall consist of a program for the protection and reclamation of the surface of the land and watercourses affected by the proposed mine, and should be based upon the terms of reference and table of contents described in the *Reclamation Permit Requirements* dated April 1991.

In addition to the above information requirements, the following issues are to be addressed in the reclamation permit application:

- o A commitment to initiate environmental monitoring and surveillance programs during mine construction is required to ensure that surface erosion impacts on water quality are minimized and that design criteria for tailings dams, runoff diversions, collection ditches and other water management structures are strictly adhered to.
- o Proposed environmental monitoring programs to confirm the absence of acid mine drainage are required. These programs shall address questions regarding the identification and segregation of possible small pockets and lenses of pyritic rock in the pit, and shall include proposed blast hole sampling methods and frequencies, turnaround times for sample analyses and contingency plans for prevention of acid drainage from pyritic waste rock. Specific sampling and analyses requirements will be subject to permits issued under the *Waste Management Act*.
- o Study programs into the methods of achieving specific land use objectives shall include a program for evaluation of copper/molybdenum ratios in plants, as well as metal toxicity levels in tailings supernatant and seepage ponds where livestock or wildlife may be exposed to them.
- o Study programs to evaluate the cumulative effects of fertilization of reclaimed lands on total nutrient loading and impacts to receiving waters.
- o Due to the heavy recreational use of Bootjack and Polley Lakes, visual impacts and aesthetic values should be given high priority in reclamation planning. Methods of reducing visual impacts and of restoring aesthetic values following mine closure are therefore required.
- o The Ministry of Forests has been requested to consider visual impacts in further logging plans for the area, particularly to buffer visibility of the mine site from recreation sites located on Bootjack and Polley Lakes.
- o Detailed waste dump reclamation plans are required, including proposed cross-sections of final dump configurations, proposals for dump revegetation, strategies for improving visual quality, and contingencies for resloping and covering, if necessary.
- o Design plans are required for any proposed rock drains to be constructed in overburden or waste rock dumps, to determine if a detailed technical assessment is required.
- o A projection of reclamation and mine closure and decommissioning costs is required and shall include the costs of surface reclamation, habitat compensation, post-closure environmental monitoring and long term impact mitigation strategies.

A reclamation permit issued under the *Mines Act* will include conditions consistent with reclamation standards contained in Part 10 of the *Health, Safety and Reclamation Code for Mines in British Columbia*. In addition the permit will contain special conditions including the following:

- o A monitoring program approved by the Regional Manager, Fish and Wildlife, Ministry of Environment, Lands and Parks shall be designed and implemented by Imperial Metals to identify impacts on the fisheries resource due to possible changes in the productivity of Polley and Bootjack Lakes due to lake level changes, operation of the fishway at the outlet of Polley Lake, and changes in stream morphology and juvenile fish production due to regulated stream flows in Hazeltine Creek.
- o A plan for mitigation and/or off-site compensation approved by the Regional Manager, Fish and Wildlife, Ministry of Environment, Lands and Parks shall be submitted if fish habitat is lost as a result of tailings pond location, impact of the dam on Polley Lake or failure of the fishway.
- o A creel survey approved by the Regional Manager, Fish and Wildlife, Ministry of Environment, Lands and Parks shall be designed and implemented by Imperial Metals to monitor angler effort and catch in the sport fishery. This monitoring program shall be implemented prior to mine construction and continue for a minimum of four years.
- o Programs satisfactory to the Regional Manager, Fish and Wildlife, Ministry of Environment, Lands and Parks to monitor gravel quality in lower Hazeltine and Edney Creeks and salmon populations in creeks affected by the regulation of Polley Lake shall be designed and implemented by Imperial Metals.
- o A plan for mitigation of, and/or compensation for, wildlife habitat impacts due to the tailings pond and Gavin Lake road relocation shall be submitted if significant values are identified.
- o Post-closure monitoring and maintenance of the site shall be provided as required by the Chief Inspector of Mines and the Regional Manager, Environmental Protection, Ministry of Environment, Lands and Parks to demonstrate that reclamation objectives including land use, productivity, water quality and stability of structures have been achieved.
- o In the event that acid mine drainage occurs, or effluent streams are identified which carry unacceptably high metal levels, all contaminated drainage shall be collected and treated to a level that assures long term protection of environmental quality.
- o Borrow material from within the tailings impoundment and sediment pond areas shall be used to maximum practical advantage to reduce the visual impacts of mining.

- o Imperial Metals shall deposit reclamation securities in an amount based upon an assessment of the actual projected costs of mine reclamation and closure, including the costs of long term monitoring and maintenance, as described in the reclamation plan and permit.

Prior to issuance of permits and approvals under the *Waste Management Act*, Imperial Metals shall, to the satisfaction of the Regional Manager, Environmental Protection, Ministry of Environment, Lands and Parks, Prince George:

- o submit a plan to contain runoff/seepage from the ANFO storage site, powder magazine and explosives plant to minimize ammonia toxicity and nitrate fertilization of the aquatic environment;
- o submit a plan to minimize the use and release of phosphorous from sources, such as truck wash facilities, showers, laundry, kitchen, etc., to minimize discharge and seepage of nutrients to receiving waters; and
- o provide an environmental protection plan to minimize the impact of road upgrading, and any site preparation for the tailings pond, pit and waste dumps.

Prior to the issuance of approvals or licences under the *Water Act*, Imperial Metals shall, to the satisfaction of the Regional Manager, Water Management, Ministry of Environment, Lands and Parks, Prince George:

- o in consultation with the Regional Manager, Fish and Wildlife, Ministry of Environment, Lands and Parks, Prince George, develop plans for construction activities at stream crossings during the upgrade of the road and the construction of the tailings line, and submit an application for approval under the Act; and
- o submit plans showing the amount and location of source of the short-term use of water to supply the construction camp, and submit an application for approval under the Act.

Prior to the issuance of permits and approvals for the mine workings under the *Mines Act*, the company shall, to the satisfaction of the District Inspector and Resident Engineer, Environmental Impact Management Group, Ministry of Energy, Mines and Petroleum Resources, Prince George:

- o provide at least one NS and one EW section for each pit, showing a fence of holes and assay data similar to Figures 2-5, 2-6 and 2-7 in the Stage I Report (1990). This requires, as a minimum, providing an EW section for the Central Pit, and NS sections for both the West and North Pits;
- o provide information on grades, tonnages and strip ratios for each individual pit. Grade information should be provided for both copper and gold, and not for a gold or copper equivalent; and

- o complete all details of mine planning, as outlined in the Health, Safety and Reclamation Code, issued pursuant to the *Mines Act*.

Prior to the issuance of a Special Use Permit under the *Forest Act*, the company shall:

- o submit plans for the access road upgrading to the District Manager, Cariboo Forest Region, Ministry of Forests.

The following *Health Act* approvals will be required by the company prior to mine start-up:

- o Any domestic sewage flows under 5,000 gallons per day will require Health Unit approval in accordance with the B.C. Disposal Regulations. Approval of the Environmental Protection Branch, Ministry of Environment, Lands and Parks, will be required if daily volumes exceed 5,000 gallons.
- o Details of the source and systems for drinking and domestic water use are to be supplied to the local Medical Health Officer for approval.
- o Living and eating accommodation must comply with the Industrial Camp Regulations and the Regulations Governing the Sanitation and Operation of Food Premises.

4.2 Mine Construction

Prior to the issuance of approvals and licences under the *Water Act*, Imperial Metals shall to the satisfaction of the Regional Manager, Water Management, Ministry of Environment, Lands and Parks, Prince George:

- o as part of any licence application, provide a minesite drainage plan including runoff collection and diversion structures around the millsite and rock dumps to direct runoff to sediment ponds for reuse in the mill process;
- o commit to construct the necessary clean water collection and diversion ditching, with appropriate flow dissipating structures for sediment control; and
- o submit plans for the design and location for the Polley Lake outlet structure to incorporate discharge flows up to the highest flushing flows (0.88 m³/s) even at low reservoir levels. The dam must incorporate a spillway to handle peak flows and a fishway as per the Stage I report design.

The water licence for water supply to the mill will require construction and operation of hydrometric stations on Hazeltine Creek and Polley Lake to facilitate flow regulation and future assessment of mean annual runoff, in addition to metering of the quantity withdrawn from Polley Lake for the mine. This should be carried out either as part of the outlet design or alternative

means. Flow regulation for the Hazeltine Creek station would be monitored immediately below the confluence with Bootjack Creek.

In addition, there may be a requirement for Imperial Metals to measure precipitation in the vicinity of the minesite to assist in runoff forecasting.

Prior to the issuance of permits under the *Waste Management Act*, Imperial Metals shall, to the satisfaction of the Regional Manager, Environmental Protection, Ministry of Environment, Lands and Parks, Williams Lake:

- o obtain approval for and complete the baseline receiving environmental monitoring program set out in the letter from J. Negraeff to R. Pasalj, dated March 11, 1991, before significant disturbance occurs on site;
- o commit to conduct water quality and other environmental monitoring programs when mine operations are suspended;
- o provide a contingency plan for treating and discharging, or containing for later recycling, sediment pond runoff during extreme storm events to ensure the protection of water quality at receiving sites; and
- o submit a data quality assurance plan for the collection and analysis of any seepage, effluent and receiving water, sediment, benthic macroinvertebrates and fish samples, including methods to achieve acceptable data precision and accuracy, to adequately control sample contamination and to reliably detect background concentrations of relevant parameters, where required.

Prior to the issuance of permits and approvals under the *Mines Act* and to meet the requirements of the Health, Safety and Reclamation Code, the company shall to the satisfaction of the District Inspector and Resident Engineer, Ministry of Energy, Mines and Petroleum Resources, Prince George:

- o provide a copy of the geotechnical report on which the wall slopes and berm widths were based;
- o provide detailed tailing dams and settling pond dam designs completed by a geotechnical engineer;
- o provide plans of machinery layout, conveyors, bins, etc., showing all safety requirements of the mining code;
- o provide plans of the ventilation layout to be built for the maintenance shop;

- o provide suitable guards along the portions of access road near the west pit during blasting in the top benches of the pit; and
- o indicate the specific types and models of haulage trucks to be used during mine operation.

4.3 Permit Conditions and Operational Requirements

Permits issued under the *Waste Management Act* or *Water Act* shall include the following conditions and expectations:

- o The Waste Management Permit will not authorize a discharge from the tailings pond or pits to the receiving environment. Imperial Metals has committed to maximum recycle of tailings and pit water, evaporation enhancing techniques and, if necessary, raising the tailings pond berm height to maintain an allowable freeboard to achieve a negative balance in the tailings pond.
- o If recycle and other water conservation efforts are not successful, Imperial Metals will be required to apply for an amendment to its permit. The Ministry of Environment, Lands and Parks will at that time decide whether to authorize a discharge and assign the terms and conditions of the discharge.
- o Imperial Metals will have to submit for review an environmental protection plan covering the operational phase of the mine in the Waste Management permit application.
- o Imperial Metals will have to submit a plan, acceptable to the Regional Manager, Environmental Protection, Ministry of Environment, Lands and Parks, Williams Lake, to identify, segregate and monitor potentially reactive wastes during operation. This should include the isolation of waste rock with adequate acid-neutralizing capability from waste rock with inadequate neutralizing capability to facilitate blending and control of acid generation.
- o Imperial Metals will have to identify strategies to reduce acid generation during operation.

Imperial Metals will be expected to:

- o neutralize and treat acidic runoff, and further reduce acid generation from occurring to a level acceptable to the Regional Manager, Environmental Protection, Ministry of Environment, Lands and Parks, Prince George, if the results of waste rock runoff monitoring or testing of waste rock indicates that acid generation or production is occurring, or is predicted to occur;
- o collect and divert runoff from the waste rock dumps and mill site runoff to the sediment ponds;

- o provide a contingency plan, acceptable to the Regional Manager, Environmental Protection, Ministry of Environment, Lands and Parks, Prince George, that identifies measures to be taken if the quantity of effluent in the sediment pond exceeds, or is predicted to exceed the quantity that can be reused or discharged without exceeding B.C. Water Quality Criteria;
- o monitor the tailings seepage collection system to ensure that there is no contamination of Edney Creek or tributaries;
- o provide an annual report of the operation of the tailings pond to include the following:
 - assessment of seepage conditions;
 - trends in the water balance over the previous year;
 - possible impact of tailings pond seepage on downstream water quality; and
- o submit for Ministry of Environment, Lands and Parks' approval a monitoring program for waste discharges and the receiving environment to assess the impacts of mine operation.

The following is required in support of an application for a Special Use Permit issued under the *Forest Act*:

- o Construction reclamation plans for the road improvement and power line right-of-way.

October 5, 1992